A UNITED STATES DEPARTMENT OF COMMERCE PUBLICATION

Welcome Aboard!

OCEAN SURVEY SHIP RESEARCHER OSS 03

UNITED STATES DEPARTMENT OF COMMERCE

NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION

Welcome Aboard!

A message from the Captain:

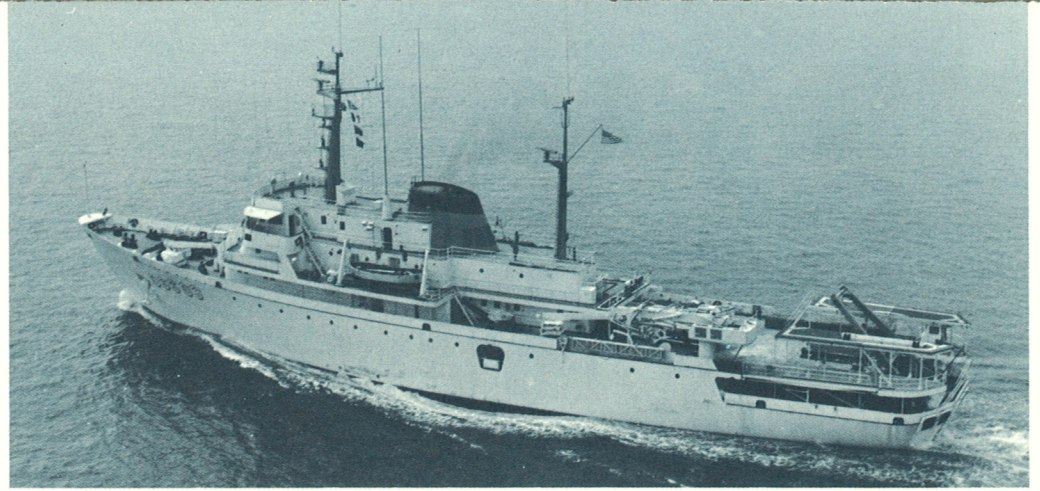
On behalf of the officers and men of the ship *Researcher,* I welcome you aboard. I hope your visit will be both enlightening and enjoyable.

The marine environment is one of man's most challenging frontiers. The *Researcher,* and ships like her, are leading the way in exploring, describing, and comprehending this complex world of ocean, atmosphere, energy, and marine life.

The officers and crew of the *Researcher* are at your disposal and will gladly answer any questions concerning the ship and her activities.

Commanding Officer
Researcher

Crewmen prepare to lower multisensor unit that measures salinity, temperature, and water depth, and transmits data directly to the *Researcher's* computer-based data-acquisition system.



The ship *Researcher* is the newest member of the scientific fleet used by NOAA, the U.S. Commerce Department's National Oceanic and Atmospheric Administration, to improve man's understanding and uses of the physical environment and marine life. Designated Ocean Survey Ship (OSS) 03, the *Researcher* is commanded by officers of the NOAA Commissioned Corps.

First of a new and relatively compact type of marine environmental platform, the class IA survey ship is 278 feet 3 inches long, has a 51-foot beam, and displaces 2,875 long tons fully loaded. The *Researcher* is propelled by two 1,600-shp geared diesels driving controllable-pitch twin screws. A 450-hp, 360-degree, retractable bow thruster propels the ship at sustained slow speeds up to 5 knots and assists in holding the ship's heading during on-station operations. The ship has a 13,000 nautical-mile range at 14.5 knots, and a maximum speed of 16 knots. She can be provisioned for six months while working in remote areas.

Enclosed areas on board are air conditioned for crew comfort and efficiency while working in extreme latitudes. Scientific facilities include an oceanographic laboratory, meteorological office, gravity room, photo lab, bow observation chamber, operations control center, and plotting room. Accommodations are provided for a normal complement of 22 officers and scientists and 54 crew and technicians. A generous stateroom with berth is available for guest scientists and dignitaries.

A versatile oceanographic research and survey vessel, the *Researcher* can handle a wide variety of oceanographic, geophysical, and other marine environmental sensing and sampling operations. Underway operations include continuous hydrographic, magnetic, gravity, and surface temperature measurements. Meteorological, bathythermographic, and geomagnetic-electrokinetographic observations are made at intervals while the ship is underway. Seismic reflection profiles (which reveal sub-bottom geological structure) and biological tows and trawls are made at reduced speeds.

To provide accurate, continuous depth records in water of all depths, the ship carries three shoal-water echo sounders, two deep-water echo sounders, a stabilized narrow-beam echo sounder (which permits the ship to run high-accuracy depth profiles even in heavy seas) with side-looking capability, and a horizontal ranging echo sounder. The ship measures magnetic field intensity with a towed proton precession sensor. Gravitational field strength is measured underway by a device which separates ship motion from the actual gravity field.

The ship's geographic position at sea can be established with a high degree of accuracy. For precise positioning of offshore surveys, several electronic position-fixing systems are available. For deep-sea navigation, the *Researcher* uses the Satellite Navigation System with worldwide capabilities, and Loran-A and Loran-C where such coverage is available. Celestial navigation supplements other methods when necessary.

An automatic gyropilot and repeaters and course recorders located at appropriate stations are integral parts of the navigation system. A magnetic compass is also available. The ship carries navigation and buoy-tracking radars. Communications facilities cover intermediate through high frequen-

cies, with very-high-frequency systems available for ship-auxiliary launch communications.

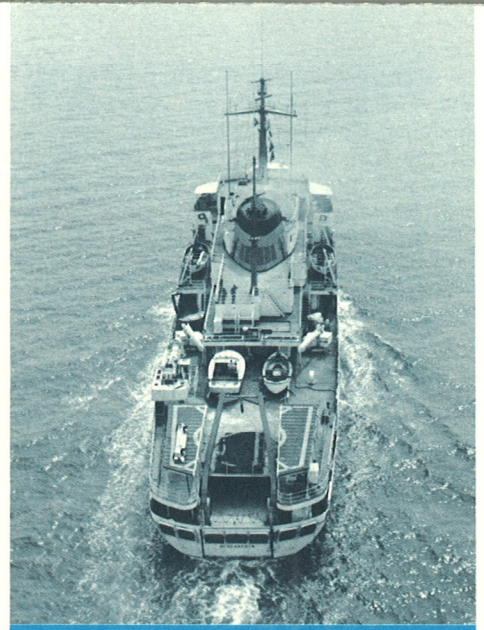
Auxiliary boats include a 25-foot survey launch, equipped with a shoal-water depth sounder, and a 26-foot motor whaleboat. The ship's after deck can be rigged with a portable landing pad for helicopter operations.

The *Researcher's* first-rate oceanographic capabilities have evolved from operational experience with previously commissioned class I vessels like the ships *Oceanographer* and *Discoverer.* Her uniquely advanced data-acquisition system records scientific data automatically from sensors aboard and suspended from the ship. A computer at the heart of the system automatically records and processes geophysical, oceanographic, hydrographic, and meteorological data, and logs the ship's position continuously and routinely.

In addition to performing the usual on-station oceanographic tasks—*e.g.,* STD (salinity-temperature-depth) measurements, coring and other bottom sampling operations, heat-flow probes, and deep-water sampling—the *Researcher* is rigged to launch and retrieve small research submersibles, cores, dredges, buoys, and other heavy oceanographic equipment using a hydraulic ramp on the stern.

To aid in oceanographic and survey operations, a variety of winches, booms, and cranes are available. Bathythermograph winches are located port and starboard on the main deck aft, and a deep-sea winch is located on the superstructure deck at three-quarter length, with power unit and double-storage units holding 45,000 feet each of 9/16-inch, 3 x 19 wire below. Two oceanographic winches with interchangeable drums for 30,000 feet of 3/16-inch wire, 12,000 feet of logging cable, and 6,000 feet of 3/8-inch wire, are located port and starboard on the superstructure deck at two-thirds length. A 40,000-pound capacity crane and an auxiliary 10,000-pound capacity crane are on the afterdeck, and four 5,500-pound capacity service cranes are located on the superstructure deck, two forward and two at two-thirds length. A 20,000-pound capacity A-frame and hydraulic ramp on the stern are also available for handling heavy equipment.

The *Researcher's* oceanographic laboratory, including the scientific data center, opens on the afterdeck work area. Facilities include peripheral laboratory benches served by fresh and salt water, five gases and compressed air, and 440, 220, and 110-volt ac power. A monorail loop connects the lab and adjacent open deck areas forward and aft. Instrumentation and equipment for centralized observation and data processing are provided in the data center. The large Inui bow bulb housing the ship's depth sounder transducer also contains an underwater observation chamber. The meteorological office is equipped with radiosonde, barometer and barograph, and readouts for surface water temperature, wind speed and direction, and ship's course and speed. Newly developed meteorological devices for balloon tracking, satellite observations, and the like will be added as they become available.

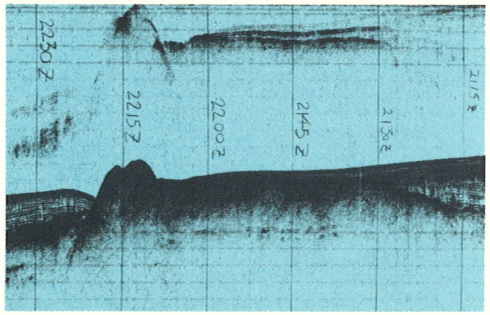


General Description

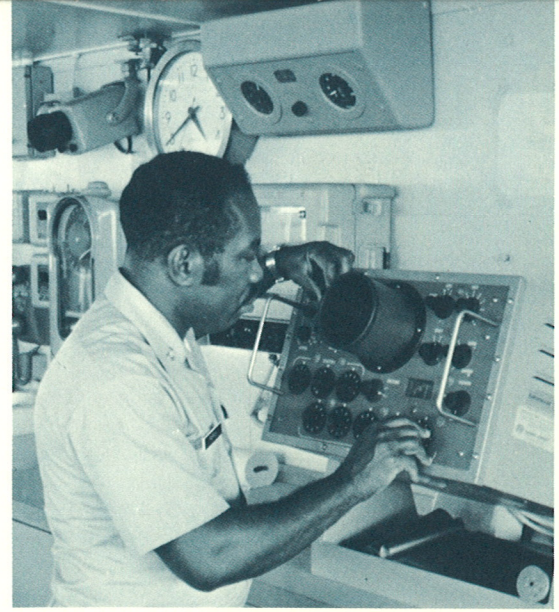
Length, overall	278 feet 3 inches
Length, load waterline	255 feet
Beam, molded	51 feet
Depth at side, molded	25 feet
Draft, full load, amidship	16 feet 3 inches
Displacement, full load	2,875 long tons
Cruising speed	14.5 knots
Range	13,000 nautical miles
Endurance	180 days
Complement	22 officers/scientists
	54 crew/techniclans

The survey ship *Researcher* was built by the Toledo plant of the American Shipbuilding Company, under the supervision of the U.S. Maritime Administration. Her keel was laid September 5, 1967, and she was launched October 5, 1968. The new ship's name derives from that of the Coast and Geodetic Survey schooner *Research*, which served with distinction in Philippine Island surveys from 1875 to 1910.

In June 1970, the *Researcher* sailed from her Lake Erie home to the Coast and Geodetic Survey's Atlantic Marine Center, Norfolk, Va., where she was outfitted and where she will be based until 1971, when the Miami ship facilities should be completed. Joining the survey ship *Discoverer*, the *Researcher* will work closely with the Atlantic Oceanographic and Meteorological Laboratories in exploring the marine environment.

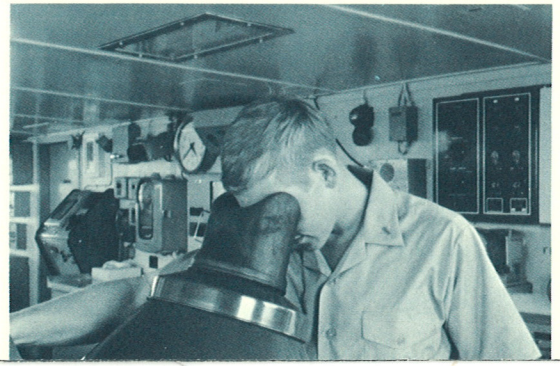


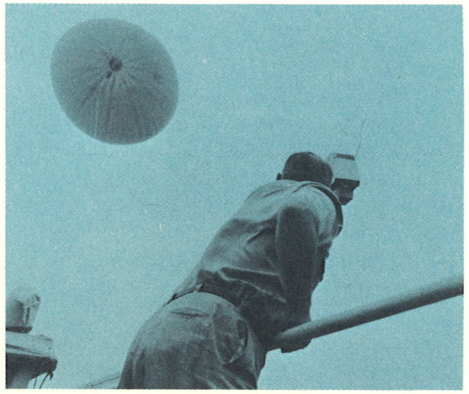
Seismic reflection profile reveals sub-bottom geologic structure. Shown here, an SRP made by the ship *Oceanographer* in 1967.



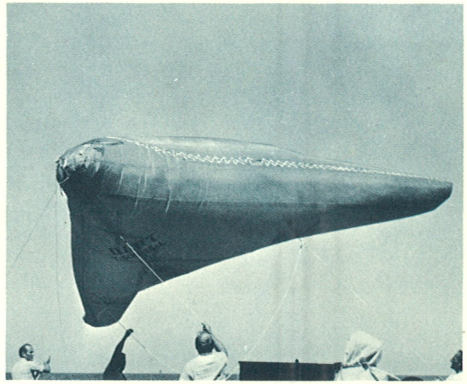
Chief quartermaster operates *Researcher's* LORAN A/C receiver, part of a versatile array of precision navigation systems.

Communications officer watches radarscope repeater in *Researcher* wheelhouse.



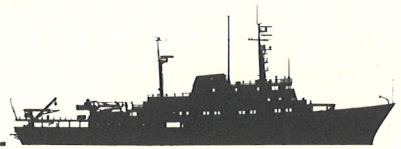


As it rises into the stratosphere, this balloon-carried miniature weather station transmits data back to the ship, which tracks the radiosonde with radar to measure winds.



Instruments suspended from this tethered balloon measure interactions in the environmentally critical boundary region between atmosphere and ocean.

NOAA — A New Agency



NOAA, the National Oceanic and Atmospheric Administration, was created within the U.S. Department of Commerce in 1970. Its formation brought together the functions of the *Environmental Science Services Administration* (and its major elements: the *Coast and Geodetic Survey, Weather Bureau, Environmental Data Service, National Environmental Satellite Center,* and *Research Laboratories*), *Bureau of Commercial Fisheries, Marine Game Fish Research Program,* and *Marine Minerals Technology Center* (from the *Department of the Interior*), the *National Oceanographic Data Center* and *National Oceanographic Instrumentation Center* (from the Department of the Navy), the *National Data Buoy Development Project* (from the Coast Guard), the *National Sea Grant Program* (from the National Science Foundation), and the *U.S. Lake Survey* (from the U.S. Army Corps of Engineers).

NOAA will explore, map, and chart the global oceans, their geological cradles, their geophysical forces and fields, and their mineral and living resources. New physical and biological knowledge will be translated into systems capable of assessing the sea's potential yield, and into techniques which the Nation and its industries can employ to manage, use, and conserve these animal and mineral resources.

NOAA will monitor and predict the characteristics of the physical environment —the protean changes of atmosphere and ocean, sun and solid earth, gravity and geomagnetism—in real time, given sufficiently advanced knowledge and technology. It will warn against impending environmental hazards, and ease the human burden of hurricane, tornado, flood, tsunami, and other destructive natural events.

NOAA will monitor and predict such gradual and inexorable changes as those of climate, seismicity, marine-life distributions, earth tides, continental position, the planet's internal circulations, and the effects of human civilization and industry on the environment and oceanic life.

To accomplish these objectives, NOAA will draw upon the talent and experience of its personnel, the wide range of its facilities, and mutually important links between government, universities, and industry. NOAA and its institutional partners will develop systems with which to comprehend this broad province of service and investigation—systems leading to effective resource assessment, utilization of environmental data, environmental monitoring and prediction, and, possibly, environmental modification and control. Here, the growing family of satellites, sensors, ships, data buoys, computers, and simulators, which have enriched scientific understanding in recent decades, will find their best achievement.

In these ways, NOAA will improve the safety and quality of life, the efficiency and timing of oceanic hunts and harvests, and man's comprehension, use, and preservation of his planetary home.

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